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A TREATISE ON THE CULTURE OF THE APPLE & PEAR, AND ON THE MANUFACTURE OF CIDER & PERRY.

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=LUDLOW=
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Jos: Banks

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THE effects of cultivation on the animal and vegetable ſyſtems are extremely ſimilar. A change in form, in colour, and in ſize or ſtature, takes place in each, and in each thoſe changes appear to ariſe from ſimilar cauſes: from a more abundant and regular ſupply of nouriſhment than is afforded in a ſtate of nature, with a favourable climate, or protection from the bad effects of an indifferent one. The offspring of every plant and animal, when unchanged by cultivation, bears a very cloſe reſemblance to it's parents, but amongſt the cultivated kinds of each, it is extremely various; ſtill however generally ſhewing ſome ſimilarity to them. By taking advantage of incidental variations, and by propagating from thoſe individuals which approach neareſt to our ideas of perfection, improved varieties of fruit, as well as of animals, are obtained. Much attention has in the preſent day been paid to the improvement of the latter, whilſt the former have been almoſt entirely neglected: probably from an opinion that theſe, being natives of warmer climates, of neceſſity degenerate in this. This opinion is however unfounded; a more favourable climate would no doubt be advantageous to every plant and animal; but the ſtall and meadow counter-balance the defects of our climate in the improvement of the one, and it is probable that the ſouth wall and highly manured border will have the ſame good effects in the other, and that the changes produced in each will be in proportion to the ſkill and induſtry of the cultivator.

The apple (on the culture of which I propoſe to offer ſome obſervations in the following pages) is not the natural produce of any ſoil, or climate; but owes it's exiſtence to human art and induſtry; and differs from the crab, which is a native of every part of England, only in the changes which cultivation has produced in it. The firſt varieties which were cultivated in England, were no doubt imported from the continent; but at what period is not, I believe, known. Many were introduced by a fruiterer of Henry the eighth, and ſome at ſubſequent periods; but I am inclined to think that we are indebted to the induſtry of the planters of the early part of the laſt, and the end of the preceding century, for moſt of thoſe we have at preſent, and probably for all the old fine cider-fruits. The exiſtence of every variety of this fruit, appears to be confined to a certain period, during the earlier parts of which only, it can be propagated with advantage to the planter. No kind of apple now cultivated appears to have exiſted more than two hundred years; and this term does not at all exceed the duration of a healthy tree, or of an orchard when grafted on crab-ſtocks, and planted in a ſtrong tenacious ſoil. From the deſcription Parkinſon, who wrote in 1629, has given of the apples cultivated in his time, it is evident that thoſe now known by the ſame names are different, and probably new varieties; and though many of thoſe mentioned by Evelyn, who wrote between thirty and forty years later, ſtill remain, they appear no longer to deſerve the attention of the planter. The Moil and it's ſucceſsful rival the Redſtreak, with the Muſts and Golden Pippin, are in the laſt ſtage of the decay, and the Stire and Foxwhelp are haſtening rapidly after them. The Redſtreak, ſo much celebrated by the writers of the laſt century, appears almoſt to have ſurvived it's fame as a cider-fruit; and indeed if it never poſſeſſed greater excellence than it does at preſent, it has certainly been much over-rated. But I ſuſpect that each kind of apple is beſt calculated for cider, when the original tree has attained it's maturity, and before it decays. Not that I think the flavour of the fruit is neceſſarily debaſed by the age of the variety; but merely that the crop in the aggregate ripens leſs perfectly, owing to the weak ſtate of ſome of the diſeaſed branches.

All efforts, which have hitherto been made to propagate healthy trees of thoſe varieties which have been long in cultivation, have, I believe, been entirely unſucceſsful.

The grafts grow well for two or three years, after which they become cankered and moſſy, and appear, what I conſider them really to be, parts of the bearing branches of old diſeaſed trees. When I firſt obſerved the unhealthy ſtate of all the young trees of theſe kinds, I ſuſpected that it aroſe from the uſe of diſeaſed grafts taken from old trees; and that I ſhould be able to propagate all the valuable varieties by buds taken from young newly grafted trees, as theſe can ſcarcely be ſaid to take any of the wood of the old ſtock with them: but to remove ſtill farther every probability of defect which might be communicated from the old trees, I inſerted the young ſhoots and buds taken from newly grafted trees on other young ſtocks, and I repeated this proceſs ſix times in as many years, each year taking my grafts, and buds, from thoſe inſerted in the year preceding. Stocks of different kinds were alſo uſed, ſome were double grafted, others obtained from apple-trees which grow from cuttings, and others from the ſeeds of each kind afterwards inſerted in them, under the idea that there might be ſomething congenial to the fruits in theſe. The grafts grew tolerably, and equally well in all, but there was always a want of hardneſs and elaſticity in the wood, and at the end of three or four years all began to canker. Several kinds of fruit were ſubjected to theſe trials, but principally the Redſtreak and Golden Pippin, (particularly the latter) and as theſe had formerly grown well in the ſame ſoil, I began to ſuſpect that their diſeaſes aroſe from the debility of age, and would conſequently be found incurable. The canker however, which conſtitutes their moſt fatal diſeaſe, often ariſes from other cauſes. It is always found in thoſe varieties which have been long in cultivation, and in theſe it annually becomes more deſtructive, and evidently ariſes from the age of the variety; but it often appears to be hereditary. A gravelly or wet ſoil, a cold preceding ſummer, or a high expoſed ſituation, add much to it's virulence. It is moſt fatal to young free growing trees of old varieties, and I have often ſeen the ſtrong ſhoots of theſe totally deſtroyed by it, when the old trees growing in the ſame orchard, and from which the grafts had been taken, were nearly free from the diſeaſe. The latter had ceaſed to grow larger, but continued to bear well, not being of very old kinds of fruit: the young ſtocks, by affording the grafts a preternatural abundance of nouriſhment, ſeemed in this inſtance to have brought on the diſeaſe; and I have always found that tranſplanting, or a heavy crop of fruit, which checked the growth of the tree, diminiſhed it's diſpoſition to canker. In middle-aged trees of very old kinds a ſucceſſion of young ſhoots is annually produced by the vigour of the ſtock, and deſtroyed again in the ſucceeding winter: the quantity of fruit theſe produce is in conſequence very ſmall. In this diſeaſe ſomething more than a mere extinction of vegetable life appears to take place. The internal bark bears marks of ſomething ſimilar to eroſion, and this, I believe, is the original ſeat of the diſeaſe, though the wood of the annual ſhoots is ſoon tinged to the centre. The canker does not appear to me to be ever a primary, or merely local diſeaſe, but to ariſe from the morbid habit of the plant, and to be incurable by any topical application.

Being, after much unſucceſsful experience, ſatisfied that thoſe varieties of the apple, of which the original trees had long periſhed from old age, could not be made to grow, I ſuſpected that grafts, taken from very young ſeedling trees, not yet in a bearing ſtate, could not by any means be made to produce fruit. Having taken cuttings from ſome of theſe of two years old, I inſerted them in ſtocks of twenty, which had already produced fruit. I afterwards frequently tranſplanted, and took every means in my power to make them produce bloſſoms; but though they grew in rich ground, which probably tended to accelerate their maturity, I did not ſucceed 'till the ſeedling trees were twelve years old, (the age at which they uſually produce fruit) and then other grafts of the ſame kind, which had been inſerted but three years before, readily bloſſomed. Other cuttings were inſerted in very old ſtocks, which were regrafted; theſe grew with exceſſive vigour, but did not produce bloſſoms ſo ſoon as the others.

From the reſult of theſe experiments, and from the general failure of every attempt to propagate every old variety of the apple, I think I am juſtified in the concluſion that all plants of this ſpecies, however propagated from the ſame ſtock, partake in ſome degree of the ſame life, and will attend it in the habits of their youth, their maturity and decay; though they will not be any way affected by any incidental injuries the parent tree may ſuſtain, after they are detached from it. The roots however, and the trunk adjoining them, appear to poſſeſs in all trees a greater degree of durability, than the bearing branches, having a power of producing new ones, when the old have been deſtroyed by accident, or even by old age: and I have found that grafts taken from ſcions, which have ſprung out of the trunks of old ungrafted apple and pear trees, grew with much greater luxuriance than thoſe taken at the ſame time from the extremities of the bearing branches. The former in their growth aſſumed the appearance of young ſeedling ſtocks, and the ſhoots of the pear were like thoſe covered with thorns. Thoſe propagated from the bearing branches frequently produced fruit the ſecond year, but the others remained long unproductive. It appears to me extremely probable that ſuch trees as the walnut, and mulberry, which do not produce fruit in leſs than twenty years, might be rendered fruitful in one third of that time, by being grafted with cuttings taken from the productive branches of an old tree.

The life of every tree appears to be greatly prolonged, when its branches are frequently taken off, and it is compelled to make uſe of the reſerved buds with which nature has provided it; and I have not the leaſt doubt but that, in the culture of the apple and pear, the life of each original tree might be prolonged to thrice its natural period, by robbing it of its branches as ſoon as the qualities of its fruit were known, and retaining it as a pollard, or more properly in the ſtate of the ſtools in a coppice, which is felled at regular periods: for theſe are known to poſſeſs a much greater degree of durability than the ſame kinds of trees when left in the natural ſtate, and to produce a vigorous ſucceſſion of branches during many centuries. It is however probable that after a certain period, each effort of nature will be inferior to the preceding; for timber trees, which have ſprung from the ſtools of an old coppice, are always obſerved to attain a ſmall ſtature, with an early maturity and decay. I believe this obſervation may be extended to every kind of tree, and that the Elm and Poplar, which are now propagated by layers and cuttings, would attain a much larger ſtature, if raiſed immediately from ſeed. The trees thus produced would have the advantages of a greater variety of form, and of tints in the ſpring and autumn foliage, which are always wanting in thoſe raiſed from the ſame ſtock, and which conſtitute no ſmall part of the beauty of foreſt trees. Should any valuable variety of the apple be retained in the ſtate I have deſcribed, I would recommend that its branches be taken off every third or fourth year, and uſed for grafts, and that it be never ſuffered to fulfil the intentions of nature by producing either fruit, or bloſſoms: under this mode of treatment I have little doubt but that the ſame variety might be propagated through many centuries.

It appears alſo probable that the latter period of the exiſtence of the apple-tree would be conſiderably prolonged

longed in a ſouthern climate, for all the old kinds grow beſt in warm ſituations, and the moſt diſeaſed flouriſhed with the greateſt vigour when I trained them to a ſouth wall. This mode of culture will not ſuit the cider-maker; but it may probably be adopted with much advantage, when new varieties are to be obtained from ſeed; and the production of theſe muſt be the firſt thing to engage the attention of the planter of the preſent day.

A few varieties of the apple are ſufficient for the moſt extenſive diſtrict, where the ſoil is of the ſame kind, and the ſituation equally warm;

but a very numerous variety will be wanting to correct the defects of every different ſoil and aſpect. The fruit liquors, for which the county of Hereford has long been celebrated, have always been ſuppoſed to derive their excellence from ſome peculiar quality in the ſoil which produces them; but a preference has been given to ſoils of oppoſite kinds by the planters of different ages. Thoſe of the laſt century uniformly contended in favour of a light ſandy loam, and on this their fineſt ciders were made: at preſent a ſoil of a diametrically oppoſite quality, a ſtrong red clay, is generally preferred.

Much of the ſoil however, which is called clay in Herefordſhire, is properly argillaceous marl; and ſome of it contains a large portion of calcarious earth, and effervеſces ſtrongly with acids: I have found this ſoil to form the ſubſtratum of ſome orchards much celebrated for producing ciders of the firſt quality. It appears to have the effect of mitigating the harſhneſs of rough. auſtere fruits; and as the trees grow with great luxuriance in it, it is perhaps of all ſoils the beſt calculated to anſwer the wiſhes of the planter. But the ſtrongeſt, and moſt highly flavoured liquor, which has hitherto been obtained from the apple, is produced by a ſoil, which differs from any of thoſe above mentioned, the ſhallow loam on limeſtone baſis of the Foreſt of Dean. Hence it is evident that thoſe qualities of ſoil, on which the ſtrength and flavour of the liquor are ſuppoſed to depend, either are not diſcoverable from external appearances, or that liquors of nearly equal excellence may be obtained from ſoils eſſentially different.

My own experience induces me to accede to the latter opinion, and to believe, that with proper varieties of fruit, the defects of almoſt every ſoil and aſpect might be corrected, and that fine ciders might be made in almoſt every part of England. Every variety of the apple is more or leſs affected by the nature of the ſoil it grows in; and the excellence of the ciders formerly made from the Red-ſtreak and Golden Pippin, and at preſent from the Stire, in light ſoils, ſeems to evince that ſome fruits receive benefit from thoſe qualities in the ſoil, by which others are injured. On ſome ſoils the fruit attains a large ſize, and is very productive of juice, on others it is more dry and highly flavoured. Where the juice is abundant, but weak, which ſometimes happens in the deep loam of the vallies, dry rich fruits, which are eminent for producing ſtrong ciders, ſhould alone be choſen: and when the aſpect is unfavourable, or the ſituation cold and expoſed, it ſeems ſufficiently evident, that all fruits, which do not attain an early maturity, ſhould be excluded. On ſome gravelly ſoils I have obſerved the fruit on the ſame tree to ripen very irregularly, and the cider to be (probably in part from this cauſe) harſh and rough: theſe defects would, I have no doubt, be removed by planting ſuch fruits only as become ripe rather early in the ſeaſon, and which are at the ſame time capable of being long kept to attain a perfect and regular maturity without decaying.

The moſt common defect in the orchards of Herefordſhire, and the adjoining counties, is the want of a ſufficient degree of warmth to bring their fruits to a perfect ſtate of maturity; for almoſt all theſe, having acquired their fame in very warm and favourable ſituations, have been tranſferred from thoſe to others, in which, except in very warm ſummers, they are never properly ripened. The liquor produced from them is conſequently harſh and unpalatable, though it frequently poſſeſſes from the nature of the fruit, a conſiderable degree of ſtrength. The want of flavour and richneſs are always attributed to the ſoil, and I believe almoſt always unjuſtly; for I do not think Herefordſhire ſo much indebted for its fame as a cider country to any peculiarity in its ſoil, as to the poſſeſſion of a few very valuable varieties of fruit, for which it appears to be indebted to the induſtry of the planters of the laſt century. Thoſe fruits will probably ſoon ceaſe to exiſt; but as good, and perhaps better, may be again produced; for the ſkill of our forefathers was by no means equal to their induſtry. They were ignorant of the ſexual ſyſtem of plants, and appear to have been regardleſs in what ſituation, or ſoil, the ſeeds they ſowed had been produced; expecting every thing from the richneſs of the mould in which thoſe, and the plants produced from them, were afterwards placed. They alſo entertained great expectations from the uſe of aromatic infuſions, in which they ſteeped the ſeeds, and with which the young plants were afterwards watered. They had probably obſerved that the milk and fleſh of animals often retained the flavour of the herbs on which they fed, and therefore concluded that the juices of plants and fruits would be affected in a ſimilar manner. But the latter, being unprovided with digeſtive organs, receive their nouriſhment from vegetable ſubſtances, only when theſe have been reduced nearly to their firſt principles by putrefaction, and have loſt all ſpecific character. Another opinion entertained by them was that any defect, either in the flavour or conſiſtence of the fruits they had raiſed, might be remedied by the kind of ſtock on which they were afterwards grafted.

I have reaſon to believe from conſiderable experience that their labours here began where they might as well have ended, and that no permanent change can be made in the future produce of the ſeeds by any mode of cultivation which can be adopted ſubſequent to their being taken from the parent tree. Each ſeed contains the root, the leaves, and germen of a future plant, and is converted into it by mere evolution; a rich or barren ſoil affording only a greater or leſs ſupply of nouriſhment to it in its unfolded ſtate. The growth of the young plants, and ſize of their fruit, will no doubt be greateſt in rich ſoils; but if the trees, or grafts from them, be afterwards planted in a poor one, I believe the fruit in this will be, preciſely what it would have been, had the trees originally grown in it. I have ſeveral times obtained two trees by grafting from a ſeedling plant of two years old, and planted the one in the garden, and the other in the cold clay of a very poor nurſery. The appearance of the former has always been the moſt promiſing, but on taking grafts from each afterwards, I never could obſerve the leaſt difference in the branches or leaves of the plants, and I therefore conclude that their fruit (though none of them have yet produced any) will be in every reſpect the ſame.

The planters of the laſt century believed that the produce of grafts would be permanently improved by inſerting them on ſtocks of different ſpecies, and afterwards propagating from them; but I am confident that no improvement ever was or will be produced by this practice. They alſo attributed the diſpoſition of their fruits to degenerate when propagated from ſeed, rather to the action of the wild ſtock, than to the ſtrong and natural propenſity of the plant to return to it's original ſtate. I believe this opinion to be entirely unfounded, but I cannot aſſert that it is ſo, and when new kinds are to be obtained from ſeeds, ſtocks raiſed from ſuch cultivated fruits as grow from cuttings would perhaps be more eligible, though the goodneſs of the fruit is never affected by any ſtock of the ſame ſpecies.

When I firſt began to ſuſpect that my endeavours to propagate the old fruits would not be ſucceſsful, I ſelected the ſeeds of ſome of the beſt kinds with an intention to propagate new ones. But I ſoon found that many of the young plants (particularly thoſe from the Golden Pippin) were nearly as much diſeaſed as the trees which produced them.

I ſeveral times raiſed three or four plants from ſeeds taken from one apple, and when this had been produced by a diſeaſed tree, I have had not only as many diſtinct varieties as there were ſeeds, but ſome were much diſeaſed and others apparently healthy; though the ſeeds were ſown in the ſame ſoil, and the plants afterwards grew within two feet of each other in the nurſery. Grafts having been inſerted from each, retained the habits of the tree from which they were taken. Few, however, if any of them appeared to poſſeſs a ſufficient degree of vigour to promiſe me much ſucceſs in their cultivation (except in very favourable ſituations) ſhould their fruit be ſuch as anſwered my wiſhes.

Having before obſerved that all the old fruits were free from diſeaſe when trained to a ſouth wall, I thought it not improbable that ſeedling plants raiſed from them would be equally healthy; and that this would not be the ſole advantage attending this mode of propagation, as the trees in this ſituation would enjoy all the benefits of a better climate, whilſt their bloſſoms, being expanded before thoſe of the neighbouring orchards, would eſcape all chance of being impregnated by the farina of inferior kinds.* With a view to try the effects of this experiment, I prepared ſtocks of the beſt kind of apple I knew, which could be propagated by cuttings, and after planting them againſt a ſouth wall in extremely rich mould, I grafted them with the Stire,

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* The ſcience of Botany is ſo widely extended that it is ſcarcely neceſſary to inform any reader that there are males and females in the vegetable as in the animal world. Each bloſſom of the apple and pear contains about twenty of the former and five of the latter. It appears from the experiments of Spallanzani that ſeveral plants are capable of producing perfect ſeeds independent of the male, but this, I have good reaſon to believe, is not the caſe in the apple or pear.

Golden Pippin, and a few other fruits whoſe time of ripening ſuited the ſituation in which I wiſhed to plant. In the courſe of the enſuing winter the young trees were dug up and (their roots having been retrenched) were again planted in the ſame places. This mode of treatment had the deſired effect of making them produce bloſſoms at two years old. I ſuffered only one or two fruits to remain on each tree, which in conſequence attained nearly three times their common ſize with a very high degree of maturity and perfection; and the appearance of the plants I raiſed from their ſeeds ſo much excelled any I had formerly obtained from the ſame fruits taken from the orchard, that I think I can confidently recommend the method I have adopted. I had choſen fruits poſſeſſing excellencies and defects of oppoſite kinds with a wiſh to ſee, either through the induſtry of the Bees or my own, the effects of a proceſs ſimilar to what is called by breeders of animals, croſſing the breed. This conſiſts in propagating from males and females not related to each other, and is certainly neceſſary, in thoſe animals at leaſt in which ſtrength and ſpirit conſtitute excellencies, to prevent their degenerating. The experiment was eaſily made, and the ſingular effects I had ſeen produced by ſimilar ones on other plants,* left me no reaſon to doubt that ſome effect would be produced in this. From the open ſtructure of the bloſſoms of vegetables, and from the numerous tribe of inſects which feed on their honey or farina, a ſexual intercourſe muſt of

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* Bloſſoms of a ſmall white garden Pea, in which the males had previouſly been deſtroyed, were impregnated with the farina of a large clay-coloured kind with purple bloſſom. The produce of the ſeeds thus obtained were of a dark gray colour, but theſe having no fixed habits were ſoon changed by cultivation into a numerous variety

of neceſſity take place between neighbouring plants of the ſame ſpecies; and I am much more diſpoſed to attribute this intercourſe to the intention, than to the negligence of nature. My wiſhes were, of courſe, to correct the defects and to combine the different excellencies of the beſt fruits; and I was not without
hopes

of very large and extremely luxuriant white ones, which were not only much larger and more productive than the original white one, but the number of ſeeds in each pod were increaſed from ſeven or eight, to eight or nine, and not unfrequently to ten. The newly made gray kinds I found were eaſily made white again by impregnating their bloſſoms with the farina of another white kind. In this experiment the ſeeds which grew
towards

hopes that the offspring would poſſeſs a greater degree of ſtrength and vigour, as it is known to do in cultivated animals.

A few days before the bloſſoms expanded of the kinds from which I wiſhed to propagate, I opened the petals and deſtroyed the males in all the bloſſoms which I ſuffered to

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towards the point of the pod, and were by poſition firſt expoſed to the action of the male, would ſometimes produce ſeeds like it in colour, whilſt thoſe at the other end would follow the female. In other inſtances the whole produce of the pod would take the colour of one or other of the parents; and I had once an inſtance in which two ſeeds at one end of a pod produced white ſeeds like the male, two at the other end gray

to remain of one kind, taking great care to leave the females uninjured: and when theſe bloſſoms were fully expanded, I impregnated half of them with farina taken from another kind of fruit, leaving the other half to the care of the Bees, which were collected in great numbers, owing to
the

gray like the female, and the central ſeed took the intermediate ſhade, a clay-colour. Something very ſimilar appears to take place in animals which produce many young ones at a birth, when the male and female are of oppoſite colours. From ſome very imperfect experiments I have made, I am led to ſuſpect that conſiderable advantages would be found to ariſe from the uſe of new or regenerated varieties of wheat; and theſe are eaſily obtained, as this plant readily ſports in varieties whenever different kinds are ſown together.

the ſcarcity of flowers at that ſeaſon, and paſſed buſily from one bloſſom to another. I had ſoon the ſatisfaction to obſerve that every fruit which I had impregnated grew rapidly, whilſt half of thoſe on the other tree, which had remained in their natural ſtate failed, with every one of thoſe left to the care of the Bees. Whence I conclude that theſe inſects are not ſo good carriers of the farina of plants as is, I believe, generally ſuppoſed by naturaliſts. Had the unmutilated bloſſoms been more numerous on the adjoining tree, or had the neighbouring orchards been in flower, the event had however probably been different. The plants I have obtained from the fruits on which this experiment has been made are certainly much the moſt promiſing I have yet ſeen, but whether they will remain free from hereditary diſeaſe and debility or not, remains to be proved. Every ſeed, though taken from the ſame apple, furniſhes a new and diſtinct variety; and ſome of theſe will grow with more luxuriance than others, and the fruits produced by the different plants will poſſeſs different degrees of merit; but an eſtimate may be made of their good and bad qualities at the concluſion of the firſt ſummer, by the reſemblance the leaves bear to the highly cultivated or wild kinds; as has been remarked by the writers, on this ſubject, of the laſt century. The plants whoſe buds in the annual wood are full and prominent are uſually more productive than thoſe whoſe buds are ſmall and ſhrunk into the bark, but their future produce will depend much on the power the bloſſoms poſſeſs of bearing cold, and this power varies in the different varieties, and can only be known from experience. Thoſe which produce their leaves and bloſſoms rather early in the ſpring are generally to be preferred, for though they are more expoſed to injury from froſt, they leſs frequently ſuffer from the attacks of inſects, the more common cauſe of failure.

The leaves of young ſeedling plants annually change, become more thick and fleſhy, and aſſume more the character of cultivated kinds. Theſe external changes indicate ſome internal ones in the conſtitution of the plant, which may poſſibly be ſimilar in their nature to thoſe which take place in animals between their infancy, and the time when they become capable of propagating their ſpecies.

The properties which conſtitute

a good apple for cider, and for the deſert, are ſeldom found in the ſame fruit, though they are not incompatible with each other. The firmneſs of the pulp, which is eſſential in the eating apple, is uſeleſs in the cider fruit, in the beſt kinds of which it is often tough, dry, and fibrous; and colour which is juſtly diſregarded in the former is amongſt the firſt good qualities of the latter. Some degree of aſtringency alſo which is injurious to the eating fruit is always advantageous to the other. Amongſt the endleſs variety of kinds which are found in Herefordſhire very few ever deſerved the attention of the planter, and the greater part of thoſe are only capable of attaining a proper ſtate of maturity in very warm ſituations. When the rind and pulp are green the cider will always be thin, weak, and colourleſs; and when theſe are deeply tinged with yellow, it will, however manufactured or in whatever ſoil it may have grown, always poſſeſs colour with either ſtrength or richneſs. The ſubſtances which conſtitute the ſtrength and body in this liquor generally exiſt in the ſame proportion with the colour, though there does not appear to be any neceſſary connection between the tinging matter and the other component parts.

The apple being moſt eaſily propagated by grafting, the means of obtaining proper ſtocks muſt be amongſt the firſt things to occupy the attention of the planter. A preference has generally, and juſtly, been given to thoſe raiſed from the ſeeds of the native kind, or crab, as being more hardy and durable than thoſe produced from the apple. The habits as well as the diſeaſes of plants are often hereditary, and attention ſhould therefore be paid to the ſtate of the tree from which the ſeeds are taken: it ſhould be large and of free growth, and rather in a growing ſtate than one of maturity or decay. The crab-trees which ſtand in cultivated grounds generally grow more freely and attain a larger ſtature than thoſe in the woods, and therefore appear to claim a preference. The ſeeds ſhould be taken from the fruit before it is ground for vinegar, and ſown in beds of rich mould an inch deep. From theſe the plants ſhould be removed in the following autumn to the nurſery, and planted in rows at three feet diſtance from each other and eighteen inches between each plant. Being here properly protected from Cattle and Hares, they may remain 'till they become large enough to be planted out, but the ground of the nurſery, which ſhould always be of good quality, muſt be regularly worked and kept free from weeds.

The propriety of grafting near the ground, or at the height of ſix or ſeven feet, will depend on the kind of fruit to be propagated, whether it be quite new and juſt beginning to bear, or a middle-aged variety. In new and luxuriant varieties it will be advantageous to graft when the ſtocks are three years old, as the growth of ſuch will be more rapid ſmooth and ſtraight than that of the Crab, and there will be no danger of theſe being injured by beginning to bear too early: but middle-aged kinds will be moſt ſucceſsfully propagated by planting ſtocks of ſix or ſeven feet height, and letting them remain ungrafted 'till they become firmly rooted in the places in which the trees are to ſtand. One graft only ſhould be inſerted in each ſtock, for when more are uſed they are apt to divide when loaded with fruit, and to cleave the ſtock, having no natural bond or connection with each other. When the ſtocks are too large for a ſingle ſcion, I would recommend that the grafts be inſerted in the branches and not in the principal ſtem. Could the future produce of young ſeedling trees be aſcertained with accuracy at four or five years old, much advantage would ariſe from inſerting buds in the annual ſhoots of ſtocks of the ſame age at the height of ſix or ſeven feet; as the planter might then be in poſſeſſion of a number of trees of any variety juſt at the age when it arrived at the bearing ſtate. But though the quality of the future produce can not be very accurately known, the experiment ſtill appears eligible, for the trees will attain the ſame height and ſize in the ſame number of years with thoſe which have been left in their natural ſtate, and, (ſhould their fruit not be found valuable) will be juſt as proper as thoſe to be grafted in the manner recommended with middle-aged varieties. An opinion was formerly entertained, and does not at preſent appear to be quite obſolete, that fruits might be improved by this proceſs of double-grafting; from the changes the ſap was ſuppoſed to undergo in it's paſſage through a ſtem belonging to different kinds of fruit. But I am inclined to think that no ſuch changes take place, and that the leaf is the chief laboratory in which nature prepares the juices of plants, and fits thoſe of the ſame ſtock to nouriſh fruits of of different forms, flavours, and colours. The width and thickneſs of the leaf generally indicate the ſize of the future apple, and the colour of the black cherry and purple grape may be known by it's autumnal tints, even in plants which have ſprung from ſeed in the preceding ſpring. The tinging matter in the leaves of theſe is probably of the ſame kind as that to which the fruits will in future owe their colours. I have ſome reaſon to believe that each variety of fruit requires it's own peculiar leaf; for I have ſeveral times grafted the branches of young apple and pear-trees cloſe above ſome buds containing bloſſoms, and theſe in four inſtances produced fruit; which grew well as long as I left any of their own leaves on the tree, but when I took theſe away, and none remained but thoſe of the grafts, which were of other kinds, they withered and fell off. Whether their falling was occaſioned by the want of proper nouriſhment or by ſome other cauſe, is a queſtion on which I am not prepared to decide.

The inexperienced planter will ſuppoſe that much time will be loſt in propagating new kinds, as theſe will not produce fruit ſo ſoon as thoſe which have been long in cultivation: but he will ſoon find that the fruit of ſmall young trees by no means repays him for the injury they ſuſtain in growth. Suppoſing the grafts to be taken from ſeedling trees of four or five years old, and inſerted in ſtocks of the ſame age; theſe will generally produce fruit in ſeven or eight years from the time of their being grafted, and they cannot in leſs time gain ſufficient height and ſtrength to be removed from the nurſery, and afterwards to be firmly rooted in the orchard; though their growth will be much more rapid than that of older kinds.

It has been ſtrongly recommended to remove the young trees once* or twice during the time they remain in the nurſery, under the idea of increaſing the number of their roots, but I think this practice only eligible with trees which do not readily grow when tranſplanted. I have always found the growth of young apple-trees to be much retarded, and a premature diſpoſition to bloſſom to be brought on by it, and I could not afterwards obſerve that thoſe trees, which had been twice removed, grew better than others. It has alſo been ſuppoſed that many ſmall roots proceeding immediately from the trunk are in the future growth of the tree to be preferred to a few large ones, but as the large roots of neceſſity branch into ſmaller ones, and probably extend to a greater diſtance, the advantages of more tranſplantations than from the ſeed-bed to the nurſery and thence to the orchard may reaſonably be queſtioned.

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* See Marſhall's rural economy of Glouceſterſhire and introductory ſketches towards a topographical hiſtory of the county of Hereford, by Rev. J. Lodge.

The apple-tree ſucceeds beſt in ſituations which are neither high nor remarkably low. In the former it's bloſſoms are frequently injured by cold winds and in the latter by ſpring-froſts, particularly when the trees are planted in the loweſt part of a confined valley. A ſouth or ſouth-eaſt aſpect is generally preferred, on account of the turbulence of the weſt, and the coldneſs of north winds, but orchards ſucceed well in all, and where the violence of the weſt-wind is broken by an intervening riſe of ground, a ſouth-weſt aſpect will be found equal to any. The trees attain their largeſt ſtature in a deep ſtrong loam, but will grow well in all rich ſoils, which are neither exceſſively ſandy nor wet. An orchard generally is moſt productive of fruit when it is ſituated near the fold-yard and is in conſequence much trod and manured by the Cattle in the winter. The ground in which old apple-trees have grown is eſteemed very unfavourable to young ones: when from contiguity to the houſe an orchard is planted in this kind of ground, the pear and apple ſhould be made to ſucceed each other, as has been judiciouſly recommended by Mr. Marſhall

In the choice of fruits for every ſituation, attention ſhould be paid to ſelect ſuch as are ſufficiently early to ripen well in it. A cider-apple may be ſafely pronounced to be too late for the ſituation it occupies, when it does not become yellow before the end of October, and I do not know any diſadvantages attending an earlier maturity, provided the kinds of fruit be capable of being kept a few weeks. An opinion, I have obſerved, prevails that the liquors obtained from all early fruits are without ſtrength, or body, but the ſtrongeſt cider yet known is produced by one of theſe, the Stire. In cold and unfavourable ſituations thoſe fruits will beſt repay the planter which in their general character appear nearly related to the native kind or crab, for though the flavour of theſe be auſtere and ungrateful to the palate, the ciders produced from ſome of them, when they have been thoroughly ripened, are often found ſmooth and generous. But I would recommend the grafts to be taken from an improved crab, and not from a degenerated apple; for the former will poſſeſs much of the hardineſs and vigour, whilſt the latter will often inherit the debility and diſeaſes, of the parent-tree. Proper fruits of this kind might probably be obtained from a crab of a deep yellow colour, and in taſte rather aſtringent than acid, trained to a ſouth-wall and impregnated with the farina of a rich early apple in the manner already recommended. I am well ſatisfied that fruits thus obtained would flouriſh in many ſituations where kinds which have been more improved by cultivation would not ſucceed, and when old trees, whoſe branches have been taken off, are to be regrafted, I have no doubt but that fruits of this kind juſt arrived at the bearing age might be uſed with very great advantage. The leaf and general habit of an improved crab will indicate a worſe fruit, and of a degenerated apple a better, than the trees will afterwards produce.

The fruit-trees of Herefordſhire are generally planted in quincunx, or in ſtraight lines croſſing each other at right angles. The former method is preferred in the hop-yards and paſture, and the latter in tillage, being leſs inconvenient to the ploughman. But it appears to me that any given number of trees planted near each other in rows, with wide intervals, would be leſs injurious either to paſture and tillage than in either of the preceding methods. The trees in each row ſhould in this caſe be of the ſame variety of fruit, that no one by poſſeſſing greater vigour and luxuriance might overgrow and ſhade another, and that the whole row might appear a continuation of the ſame tree. The intervals between would afford conſiderable ſpace for the plough or paſture, and every tree having room to extend it's branches on each ſide would be more protected than injured by it's neighbours, and would attain nearly, or quite, as large a ſtature as if intirely inſulated. The cider-maker would alſo be enabled to collect with convenience each kind by itſelf, and might afterwards mix them according to his judgment, or caprice. Unleſs an orchard be very large not more than five, or ſix, kinds ſhould be planted in it, and if ſome of theſe be ſuch as bloſſom early, and others late, the planter will have as good a chance of an annual ſupply of fruit, as a larger number of kinds would afford him.

The diſtance between each row, as well as the ſpace between each tree, muſt depend on the ſituation and ſoil. When the former is high and expoſed, the trees ſhould be cloſely planted to afford each other protection; and when the latter is poor and ſhallow their growth will of courſe be diminiſhed, and they will conſequently require leſs room. But in low and ſheltered ſituations, and deep rich ſoils, where the trees are little expoſed to winds and attain a large ſize, wider intervals muſt be allowed them. In the former inſtances a diſtance of twelve yards between each row, and half as much between each tree, will be ſufficient; in the latter twenty-four yards between each row and eight between each tree, will not be found too much, particularly if the ground is intended for tillage after the trees have grown to a conſiderable ſize. An opinion rather generally prevails at preſent in favour of planting ſingle trees at twenty or twenty-five yards diſtance from each other on arable grounds, and ſpecious reaſons may be offered in defence of this practice: the roots, as well as the branches, are at perfect liberty to extend themſelves in every direction, but the latter are every way expoſed to the ſtorms of autumn and to the cold winds of the ſpring; and trees of more hardy kinds than the apple, are well known to grow much better when planted near enough to afford each other protection, than when totally inſulated. It may be ſuppoſed that trees growing in diſtant rows will not regularly occupy the whole ſurface of the ground with their roots, but theſe always extend far beyond the branches, and will meet acroſs very wide intervals. The growth of every inſulated tree is more low and ſpreading, and conſequently more injurious to corn, or herbage, growing under it. Where the mode of cultivation will admit, the rows ſhould always extend from north to ſouth, as in this direction each part of every tree will receive the moſt equal portions of light and heat.

An orchard is generally raiſed with moſt ſucceſs and at leaſt expence in a hop-yard; the ground under this culture being always well tilled and manured, as well as fenced againſt all kinds of cattle. Conſiderable advantages may be obtained by planting twice the number, which are to remain, of trees in each row, uſing two kinds of fruit, and putting each alternately. The kind which ſucceeds beſt may be left, and the other be removed to the tillage. Trees of a large ſize may be tranſplanted without the leaſt danger in the autumn, particularly if the roots be ſhortened in the preceding winter. The ſubſoil of the ground which ſuits the hop is not unfrequently too moiſt for the apple, and this defect is rarely removed by draining. Where a hop-yard is wanting trees may be raiſed in tillage or paſture, but the expence of defending them properly will be conſiderable, particularly in the latter, in which though ever ſo well defended they uſually make but a ſlow progreſs. In tillage the leaſt expenſive, and perhaps the beſt method of raiſing an orchard will be to exclude every ſpecies of cattle, except ſheep and pigs, and to defend the trees only with ſmall branches bound round their ſtems, as in the broom or beſom of the farm-houſe. This fence muſt begin cloſe to the ground and riſe to a greater height than the ſheep or pigs, or the chains of the horſes in ploughing can reach; and to preſerve the bottoms of the ſtems from injury by the plough, a ſtrong oak ſtake ſhould be driven into the ground on each ſide of every tree. The ſmall branches which defend the ſtems will require to be replaced every other year, but this will be done at a very trifling expence.

When a plantation is to be made

in paſture ground, timber-frames will be found neceſſary. The kind moſt in uſe at preſent are made with two flat poſts placed with their wide ſurfaces parallel to each other at two feet apart, having boards nailed to their edges on each ſide with ſmall diſtances between them. The trees are here perfectly protected from cattle, but when their branches extend themſelves, and become agitated by the wind, the ſtems can ſcarcely eſcape being rubbed againſt the frames. Another and I think a much better kind of frame is made with three poſts placed triangularly round the tree, approaching each other at the roots and diverging conſiderably upwards. This appears more expenſive than the other, but timber of much inferior value may be uſed. In this method of planting the formality of the row may be diſpenſed with, but the trees will ſucceed much better if three or five be planted near each other with wide intervals, than if each ſtand entirely alone.

Little care is required, though more than is generally given in Herefordſhire, in tranſplanting the crab-ſtocks or apple-trees; but in removing from the nurſery to the orchard attention ſhould be paid to leave the roots as long and as little injured as poſſible, and not on any account to bury them deeper than they formerly grew. The ſoil round each tree ſhould be dug eighteen inches deep and four or five feet wide, placing the ſod, if the ground be paſture, in the bottom of the holes, as recommended by Mr. Marſhal. If the holes in this caſe be made ſix months before the time of planting, and if a ſmall quantity of rich mould be mixed with that of the field immediately round the roots, it will much accelerate the future growth of the trees, but it will rarely be adviſable to make uſe of any very delicate or highly cultivated fruits, when this method of planting is adopted. The branches of the Trees, whether grafted or not, and where ever planted ſhould be much retrenched, and the mould may be raiſed a few inches round the ſtems to prevent their being ſhaken by the wind. A ſtake to each will alſo be of much ſervice, but great care muſt be taken to prevent the bark of the tree receiving injury by being rubbed by it. Wherever a a plantation is to be made, the autumn is the moſt elegible ſeaſon; but if from any cauſe the planting be delayed 'till ſpring, the trees will ſucceed perfectly well, if the ſoil or ſucceeding ſeaſon be not remarkably dry. When the trees have once taken root in the hop-yard or tillage, they will not require any thing more than protection from the planter, but in the paſture the ground ſhould be annually dug three or four feet wide round each during the firſt four or five years.

The apple-tree being naturally very full of branches frequently requires the opperation of pruning, and when properly executed great advantages will be found to ariſe from it; but as it is generally performed in Herefordſhire, the injury the tree ſuſtains, is much greater than the benefit it receives. The ignorant pruner gets into the middle of it, and lays about him to right and left, 'till he leaves only ſmall tufts of branches at the extremities of the large boughs. Theſe branches, now receiving the whole nouriſhment of the tree, of courſe increaſe rapidly, and ſoon become, when loaded with fruit or ſnow, too heavy for the long naked boughs, which are of neceſſity full of dead knots from the former labours of the pruner, to ſupport. Many hundred trees annually periſh from this cauſe. I believe the preſent ſyſtem of pruning ought to be precifely reverſed, and that the pruner ſhould confine himſelf almoſt entirely to the extremities of the bearing branches, which are always too full of wood, and leave the internal part of the tree, for reaſons I ſhall mention when ſpeaking of blights, nearly as he finds it. Large branches ſhould rarely, or never, be amputated. In the garden-culture of the apple, where the trees are retained as dwarfs or eſpaliers, the more vigorouſly growing kinds are often rendered unproductive by the exceſſive, though neceſſary, uſe of the pruning-knife. I have always ſucceeded in making trees of this kind fruitful by digging them up, and replacing them with ſome freſh mould in the ſame ſituation. The too great luxuriance of growth is checked, and a diſpoſition to bear is in conſequence brought on.

Through the negligence of the Herefordſhire farmers their orchards are often greatly injured by miſletoe and moſs. The firſt of theſe plants is eaſily removed, and as it makes excellent food for ewes in the ſpring, it is almoſt always worth the expence of collecting at that ſeaſon. Moſs appears to conſtitute a ſymptomatic, rather than a primary, diſeaſe in fruit-trees: it is often brought on by a damp, or uncultivated ſoil, by the age of the variety of fruit, and by the want of air and light in cloſely planted unpruned orchards. In theſe caſes it can only be deſtroyed by removing the cauſe to which it owes it's exiſtence.

Blights are produced by a variety of cauſes, by inſects, by an exceſs of heat or cold, of drought or moiſture; for theſe neceſſarily derange and deſtroy the delicate organization of the bloſſom: but I believe the common opinion that they ariſe from ſome latent noxious quality in the air, or from lightning, to be totally unfounded. The term "Blight" is very frequently uſed by the gardener and farmer without any defined idea being annexed to it. If the leaves of their trees be eaten by the caterpillar, or contracted by the aphis; if the bloſſoms fall from the ravages of inſects, or without any apparent cauſe, the trees are equally blighted: and if an eaſt wind happen to have blown, the inſects, (or at leaſt their eggs) whatever be their ſize, are ſuppoſed to have been brought by it. This opinion, which was abſurdly entertained by the philoſophers of the laſt age, probably has owed it's exiſtence to the hazy appearance of the air, which uſually accompanies warm days and froſty nights with a north-eaſt wind in the ſpring. This weather is injurious to the bloſſom of every tree, and particularly ſo to that of the apple; for the warmth of the day hatches the eggs of the inſect which breeds in it, whilſt the coldneſs of the night, by checking the progreſs of the ſap, retains the bloſſom in it's half-expanded ſtate to form a nidus for it. This * inſect

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[*] The leaves and bloſſoms of the apple-tree are ſometimes entirely deſtroyed by a numerous tribe of caterpillars, ſome kinds of

which aſſumes the winged ſtate in July, is a ſmall brown beetle, and it then probably lays thoſe eggs on the trees, which, if the ſucceeding ſeaſon be unfavourable, prove deſtructive of the future crop of fruit. The bloſſoms of the apple appear alſo to fail not unfrequently from the want of impregnation,[†] when the

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which become moths in the ſummer and autumn, and others in the ſucceding ſpring. Theſe however do not in any excluſive degree belong to the apple-tree, being found on

[†] The fruit being merely the capſule or ſeed-veſſel, probably ſometimes attains maturity without being impregnated, but I believe it will in this, as in ſome other plants,

the weather is unuſually hot and dry, or when cold winds prevail; for I have often obſerved the farina to wither and die on the autheræ in ſuch ſeaſons. In each of theſe caſes I have always ſeen thoſe trees

on many other trees; but there is an extremely minute inſect of the cochineal tribe, which has lately appeared on the apple-trees near London, and has done incredible damage to them. Small downy ſpots appear on the ſtems and branches of the trees, each

plants, be without ſeeds. I have often attentively deſtroyed the male bloſſoms of the cucumber and the antheræ of the pea; when the fruit of the one, and the pod of the other, generally attained their uſual ſize, but the ſeeds remained nearly as they were before the bloſſoms expanded.

moſt productive, which, having had the good fortune to eſcape the deſolating hand of the pruner, were moderately full of wood, and capable of affording their bloſſoms ſome protection from froſt and cold winds, or

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of which covers a multitude of theſe inſects, which are attached to the bark by their ſuckers and fed by it's juices. The trees, on which they abound, appear like tender exotics, the points of whoſe branches have been killed by the preceding winter. I am informed by Sir Joſeph Banks that theſe inſects were firſt obſerved in the neighbourhood of Kennington, in 1788, and that they were ſaid to have been imported from France, but he could not obtain any information from his correſpondents in that country of their exiſtence there. They have or exceſſive heat. I would not be underſtood to diſapprove of judicious pruning, on the contrary I think it ought very frequently to be done; but the tree ought always to retain much of the cloſe branchy growth, which

have ſince gradually extended themſelves round the centre where they firſt appeared, and no means of deſtroying them have been yet diſcovered. Apple-trees ſhould not on any account be brought into the cider-counties from any neighbourhood where theſe inſects are ſuſpected to exiſt, and every precaution ſhould be taken to prevent their introduction. It is the opinion of the moſt experienced nurſerymen round London, that all the apple-trees in that neighbourhood will be deſtroyed in a few years, if the inſects increaſe as rapidly as they have lately done.

which it's nature always gives it. The pruning-knife may however be uſed with ſome degree of freedom on young trees, for the branches of theſe ſoon repair any breaches which may be made in them; but if an old tree, or one which has ceaſed to grow larger, be ſo thinned as to admit of a free current of air through it, it is ruined for ever. It has been ſuppoſed that the fruit, which ſtands expoſed to the ſun and air on the outſides of the branches, is alone capable of making fine cider, but experience by no means juſtifies this concluſion.

A part of the Herefordſhire farmers

mers are extremely well ſkilled in the management of the fruit, and in the ſubſequent management of their cider; but the greater number are almoſt entirely ignorant of both. To the latter claſs only the following obſervations, in which I ſhall do little more than detail a part of the practice of the former, are addreſſed.

The merit of cider will always depend much on the proper mixture, or rather on proper ſeparation of the fruits. Thoſe whoſe rinds and pulp are tinged with green, or red without a mixture of yellow (for that colour will diſappear in the firſt ſtages of fermentation) ſhould be carefully kept apart from ſuch as are yellow, or yellow intermixed with red. The latter kinds, which ſhould remain on the trees 'till ripe enough to fall without being much ſhaken, are alone capable of making fine cider. Each kind ſhould be collected ſeparately, and kept 'till it becomes perfectly mellow. For this purpoſe, in the common practice of the country, it is placed in heaps of ten inches or a foot thick, and expoſed to the ſun and air, and rain; not being ever covered except in very ſevere froſts. The ſtrength and flavour of the future liquor are however increaſed by keeping the fruit under cover ſome time before it is ground; but unleſs a ſituation can be afforded it, in which it is expoſed to a free current of air, and where it can be ſpread very thin, it is apt to contract an unpleaſant ſmell, which will much affect the cider produced from it. Few farms are provided with proper buildings for this purpoſe on a large ſcale, and the improvement of the liquor will not nearly pay the expence of erecting them. It may reaſonably be ſuppoſed that much water is abſorbed by the fruit in a rainy ſeaſon, but the quantity of juice yielded by any given quantity of fruit will be found to diminiſh, as it becomes more mellow, even in very wet weather, provided it be ground when thoroughly dry. The advantages therefore of covering the fruit will probably be much leſs, than may at firſt ſight be expected.

No criterion appears to be known, by which the moſt proper point of maturity in the fruit can be aſcertained with accuracy; but I have good reaſon to believe that it improves, as long as it continues to acquire a deeper ſhade of yellow. Each heap ſhould be examined prior to it's being ground, and any decayed or green fruit carefully taken away. The expence of this will be very ſmall, and will be amply repaid by the excellence of the liquor, and the eaſe with which too great a degree of fermentation will be prevented. Each kind of fruit ſhould either be ground ſeparately, or mixed with ſuch only as becomes ripe preciſely at the ſame time; but it is from the former practice that fine ciders, of different flavours and degrees of ſtrength, are beſt obtained from the ſame orchard. In grinding, the fruit ſhould be reduced, as nearly as poſſible, to an uniform maſs, in which the rind and kernels are ſcarcely diſcoverable. For this purpoſe the Herefordſhire mill, which is made with a large ſtone, ſimilar to thoſe uſed for grinding corn, ſupported on it's edge, and drawn round a circular trough in which the apples are placed, appears beſt calculated. Iron mills have been tried, but this metal is ſoluble in the acid of apples, to which it communicates a brown colour, and an unpleaſant taſte. No combination has, I believe, been aſcertained to take place between this acid and lead, but as the calx of this metal readily diſſolves in, and communicates an extremely poiſonous quality to the acetous juice of the apple, it ſhould never be ſuffered to come into contact with the fruit, or liquor.

After the fruit has been thoroughly ground, the reduced pulp ſhould remain twenty-four hours before it is taken to the preſs. If the fruit has been thoroughly ripe and mellow, a large quantity of the pulp will paſs through the hair-cloth which is uſed in preſſing, and as this will be thrown off in the firſt ſtages of fermentation, the caſks, in which the liquor is placed to ferment, ſhould want about a gallon each of being full. Some advantages are found in the uſe of open veſſels, but theſe can only be uſed under cover, and are therefore proper only where the quantity of liquor to be manufactured is ſmall.

The fermentation of liquors has been divided into three ſtages, the vinous, the acetous, and the putrifactive. The firſt has been obſerved to take place in ſuch bodies only as contain a conſiderable portion of ſugar, and it is always attended with the decompoſition of that ſubſtance. The liquor gradually loſes it's ſweetneſs, acquires an intoxicating quality, and by diſtillation affords a greater or leſs quantity of ardent ſpirit, according to the quantity of ſugar it originally contained, and the ſkill with which the proceſs has been conducted. When this fermentation proceeds with too much rapidity, it is often confounded with the acetous, but the products of that are totally different. A violent degree of fermentation however, tho' purely vinous, is extremely injurious to the ſtrength and permanence of cider, probably owing to a part of the ardent ſpirit being diſcharged along with the diſengaged air.

The acetous fermentation uſually ſucceeds the vinous; but it will ſometimes precede it, when the liquor is in ſmall quantity, and expoſes a large ſurface to the air. In this, vital air is abſorbed from the atmoſphere, and the ardent ſpirit, vegetable acid, and ſugar, if any remain, are alike converted into vinegar.

In the putrifactive proceſs which follows the acetous, the vinegar loſes it's acidity, becomes foul and viſcid, and emits air of an offenſive ſmell: an earthy ſediment ſubſides, and the remaining liquid is little but water.

The juice of the apple in it's unfermented ſtate conſiſts of ſugar, vegetable mucilage, acid, water, it's tinging matter, the principle of ſmell, and, I believe, of aſtringency.* Of theſe component parts, the firſt only is known to be capable of producing ardent ſpirit, and it might thence be inferred that the ſtrongeſt ciders would be afforded by the ſweeteſt fruits: but the juice of theſe generally remains defective in what is termed "Body" in liquors, and it is extremely apt to paſs from the ſaccharine to the acetous ſtate. Much of the ſtrength of cider is ſuppoſed by the Herefordſhire farmers to be derived from the rind

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* I uſe the term "principle of aſtringency" but I do not know that the aſtringency of fruits

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fruits reſides in the ſame ſubſtance which is found in the huſks of nuts, and in green tea and other vegetables, and to which Chymiſts have given this name.

and kernels of the fruit, and hence ariſes their great attention to grind it thoroughly; the ſtalks alſo are neceſſarily reduced, when the apples are thoroughly ground, and I ſuſpect that the body of the liquor is ſtrengthened, and it's flavour improved, by the aſtringent juice of theſe: yet it does not appear probable that either of theſe contains any ſaccharine matter.

The ſtrongeſt ciders (and I believe the ſtrongeſt wines) are made from fruits which poſſeſs ſome degree of aſtringency; and this quality is ſo neceſſary in the Pear, that I have never known a ſingle inſtance in which perry, made from fruits that were without it, did not become ſour before the middle of the ſucceeding ſummer. It may be preſerved by a mixture of the harſh juice of the crab, and this, I imagine, is effected more by the aſtringent than by the ſaccharine matter, the latter contains. If I am right in this conjecture, it will not appear very improbable that the quality Hops poſſeſs of preſerving malt-liquors in the vinous ſtate, depends on their containing the aſtringent principle. This is not readily diſcovered on the palate, but if a plate of poliſhed iron be boiled a few minutes in a ſtrong decoction of them, the loſs of it's poliſh, and a black colour communicated to thoſe in contact, ſeem to evince it's preſence: the decoction however does not act very powerfully on a ſolution of martial vitriol

The time which will elapſe before the vinous fermentation takes place in the juice of the apple, is extremely uncertain. If the fruit be immature, and the weather warm, it will commence in leſs than twenty-four hours; but when that has been thoroughly ripened, and the weather proves cold; it will remain a week, or fortnight, or longer, without the leaſt apparent change; particularly in the juice of thoſe fruits, which produce the ſtrongeſt ciders. In the commencement of fermentation the dimenſions of the liquor are enlarged, an inteſtine motion is obſervable in the caſk, and bubbles of fixed air begin to riſe and break on the ſurface. If the caſk be placed in a vault, or other ſituation where there is but little change of temperature, the fermentation will generally proceed 'till the whole of the ſaccharine part is decompoſed, and the liquor is become rough, and unpalatable to thoſe unaccuſtomed to it in this ſtate.

But as cider, which contains a conſiderable degree of ſweetneſs, is moſt valuable, much attention is employed to prevent an exceſs of fermentation. This is uſually done by placing the caſks in the open air, which is much the moſt effectual method; or in ſheds through which there is a free current of it, and by drawing off the liquor from one caſk to another, and ſometimes by expoſing it to the air in flat ſhallow veſſels, whenever the fermentation proceeds with too much rapidity. By the firſt of theſe means the liquor is kept cool, and it's decompoſition is in conſequence retarded; but the effect of racking off, unleſs the liquor be bright, does not appear to be ſo well aſcertained. It is generally done with a view to cool it, but heat is rarely, or never, diſengaged in the fermentation of cider; and the air through which it paſſes, when the operation is performed in the day, is uſually ſeveral lines warmer than the body it is ſuppoſed to cool. Some degree of cold will no doubt be produced by evaporation, but never ſufficient to produce the total ſuſpenſion of fermentation, which takes place after the liquor has been drawn off from one caſk to another. It no doubt gives out ſomething to, and may poſſibly receive ſomething from, the atmoſpheric air; with which it can never have been properly in contact, having been always covered with a ſtratum of fixed air. This may at any time be proved by holding a lighted candle cloſe to it's ſurface, where it will be immediately extinguiſhed.

The progreſs of fermentation, if the weather be cool and ſettled, will generally become entirely ſuſpended in a few days; and the liquor will then ſeparate from it's impurities. Whatever is ſpecifically lighter will riſe to it's ſurface, whilſt the heavier lees will deſcend to the bottom; leaving the intermediate liquid perfectly clear and bright. This muſt inſtantly be drawn off, and not ſuffered on any account again to mingle with it's lees; for theſe poſſeſs much the ſame properties as yeaſt, and would inevitably bring on a ſecond fermentation. The beſt criterion to judge of the proper moment to rack off will be the brightneſs of the liquor; but this is always attended with external marks, which ſerve as guides to the cider-maker. The diſcharge of fixed air, which always attends the progreſs of fermentation, has entirely ceaſed;

and a thick cruſt, formed of fragments of the reduced pulp raiſed by the buoyant air it contains, is collected on the ſurface. The clear liquor being drawn off into another caſk, the lees are put into ſmall bags, ſimilar to thoſe uſed for jellies: through theſe whatever liquor the lees contain gradually filtrates, becoming perfectly bright; and it is then returned to that in the caſk, in which it has the effect, in ſome meaſure of preventing a ſecond fermentation. It appears to have undergone a conſiderable change in the proceſs of filtration. It's colour is remarkably deep, it's taſte harſh, and flat, and it has a ſtrong tendency to become acetous; probably by having given out fixed, and abſorbed vital, air. Should it become, acetous, which it will frequently do in forty-eight hours, it muſt not on any account be put into the caſk. If the cider, after being racked off, remains bright and quiet, nothing more is to be done to it, 'till the ſucceeding ſpring; but if a ſcum collects on the ſurface, it muſt be immediately racked off into another caſk; as this would produce bad effects, if ſuffered to ſink. If a diſpoſition to ferment with violence, again appears, it will be neceſſary to rack off from one caſk to another, as often as a hiſſing noiſe is heard. The ſtrength of cider is much reduced by being frequently racked off, but this ariſes only from a larger portion of ſugar remaining unchanged, which adds to the ſweetneſs, at the expence of the other quality. The juice of thoſe fruits, which, produce very ſtrong ciders, often remains muddy during the whole winter, and much attention muſt frequently be paid to prevent an exceſs of fermentation. The ſmoke of ſulphur is ſometimes uſed, and bullock's blood to render it bright: the latter is a diſguſting practice, and both are unneceſſary when the liquor has been made from good fruits, properly ripened.

The caſks, into which the liquor is put whenever racked off, muſt always have been thoroughly ſcalded, and dried again; and each ſhould want ſeveral gallons of being full, to expoſe a larger ſurface to the air. Should the weather be uncommonly cold, a covering of ſtraw will be neceſſary. In the end of March, or the beginning of April, the cider is generally fit to be taken from the hands of the manufacturer, and it is then put into the caſks in which it is to remain. Theſe are now to be filled entirely, and ſtopped as ſoon as all danger of further fermentation is over; which is ſuppoſed to be whenever a blue film begins to collect on the ſurface of the liquor. It will however be proper to put the bungs in ſomewhat earlier, to exclude the external air; but they ſhould not be driven in firmly, leſt fermentation ſhould recommence, and endanger the caſks. A ſmall quantity of ſpirit is ſometimes added; and when ſcarcely any degree of fermentation has taken place, and the liquor in conſequence retains nearly the taſte of the unfermented juice, it may probably be uſed with advantage: but when it has fermented properly, it is always unneceſſary; and I have ſometimes known a renewed and violent fermentation produced by it, which has proved fatal to the liquor.

Ciders, which have been made from good fruits, and have been properly manufactured, will retain a conſiderable portion of ſweetneſs, in the caſk, to the end of three or four years; but the ſaccharine part, on which alone their ſweetneſs depends, gradually diſappears; probably by a decompoſition and diſcharge of fixed air, ſimilar to that which takes place in the earlier ſtages of their fermentation. Cider is generally in the beſt ſtate to be put into the bottle at two years old; where it will ſoon become briſk and ſparkling; and if it poſſeſſes much richneſs, it will remain with ſcarcely any ſenſible change during twenty, or thirty years; or as long as the cork duly performs it's office.

In making cider for the common uſe of the farm-houſe, few of the foregoing rules are, or ought to be attended to. The flavour of the liquor is here a ſecondary conſideration with the farmer; whoſe firſt object muſt be to obtain a large quantity, at a ſmall expence. The common practice of the country is ſufficiently well calculated to anſwer this purpoſe: the apples are uſually ground as ſoon as they become moderately ripe, and the juice is either racked off once as ſoon as it becomes bright, or more frequently conveyed from the preſs directly to the cellar. A violent fermentation ſoon commences, and continues 'till nearly the whole of the ſaccharine part is decompoſed. The caſks are filled up and ſtopped early in the ſucceeding ſpring, and no further attention is either paid, or required. The liquor thus prepared may be kept from two, to five or ſix, years in the caſk, according to it's ſtrength. It is generally harſh and rough,* but rarely acetous, and in this ſtate, I believe, it is uſually ſuppoſed to be preferred by the farmers and peaſantry. But this opinion is not well founded: they like it beſt when it poſſeſſes much ſtrength with moderate richneſs, and when it is without any thing harſh, or ſour in it's flavour; but they will drink it, and to a moſt extraordinary exceſs, when it is really acetous. They will however acknowledge, when they offer this kind to a ſtranger, (which they are at all times ready to do with great liberality) that the operation of ſwallowing it is rather a ſevere one; but they always aſſure him that it will do him good, if he can get it down. And indeed if we may judge from the wonderful quantities they drink without apparent injury, we may venture to pronounce it at leaſt as wholeſome as any amongſt the various kinds of malt-liquors. It muſt however be admitted that the ſweet flatulent liquor, which is generally ſold out of the cider-counties, is far otherwiſe; for much of this having become harſh, and even acetous, has been afterwards ſweetened in the cellar of the merchant.

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* When it has become extremely thin and harſh by exceſs of fermentation, the addition of a ſmall quantity of bruiſed wheat, or ſlices of toaſted bread, or any other farinaceous ſubſtance, will much diminiſh it's diſpoſition to become ſour.

An inferior kind of liquor is made by macerating the reduced pulp, from which the cider has been preſſed, in a ſmall quantity of water, and regrinding it. The reſidue of three hogſheads of the latter, yields about one of the former, which may be kept 'till the next autumn, and uſually ſupplies the place of cider in the farm-houſe, for all purpoſes except for the labourers in the harveſt. It is generally fit to drink very ſoon after it is made, and though no attention is ever paid to it during it's fermentation, it often remains, 'till near the end of the ſucceeding ſummer, more palatable than the cider preſſed from the ſame fruit.

I believe the experiments I have mentioned in the former part of theſe obſervations, will be ſufficient to convince the reader, that under common management, little ſucceſs is to be expected in the cultivation of the old *fruits; under which name I include

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* I would wiſh to guard the unexperienced planter againſt truſting to the aſſertions of nurſery-men, particularly ſome in the neighbourhood

I include every variety, of which a ſingle old and decayed tree can any where be diſcovered. A graft, taken from a bearing branch of a tree in this ſtate, carries with it the habits and diſeaſes of that branch, and can never form what can with propriety be called a young tree: it will be the continuation of an old one, and each plant will form an unnatural union of youth and

neighbourhood of London; who will promiſe to ſend him trees of the Golden Pippin, or of any other kind of apple, that will not canker. But they are much in the habit of promiſing what they cannot perform, and are extremely ignorant of every thing beyond the mere routine of their profeſſion;

and age, of the living and the dead. Though my own efforts, as well as thoſe of every other planter with whom I am acquainted, have been totally unſucceſsful, I am far from wiſhing to diſcourage any experiments in the nurſery, or garden; but I recommend it to every man, who plants an orchard, to chuſe thoſe kinds of fruit only, of which he knows the firſt, original, tree to exiſt

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feſſion; and (as uſually happens) poſitive in proportion as they are ignorant. As long as the inſect I have already noticed (page 89) exiſts in the nurſeries round London, apple-trees ſhould not on any account be taken from them to ſituations where it is not known.

exiſt in health and vigour; or thoſe at leaſt of which a ſingle old diſeaſed tree can not be found: for he will certainly ſee every one he plants affected by the age and ſtate of the original tree, as I have already remarked. The loſs, the county of Hereford ſuſtains by the uſe of old diſeaſed varieties of fruit, is enormouſly great; it's produce, I have not the ſmalleſt doubt, being reduced to leſs than one half, of what it might be. An acre of good ground, fully planted with proper fruits, ought and will afford, an average produce of four, or five, hundred gallons a year; but I am afraid that the orchards of Herefordſhire in the aggregate ſcarcely furniſh one third of that quantity in their preſent ſtate.

The directions I have given, will probably be found ſufficient for the inexperienced farmer in the manufacture of his cider: but the reader, who deſires further information on the ſubject, will find it treated more at length in Mr. Marſhall's rural economy of Glouceſterſhire, to which I wiſh to refer him, whilſt I proceed to offer a few obſervations on the culture of the pear.

THE experiments I have made on the pear have not been nearly ſo numerous as thoſe on the apple, and have been confined to a ſingle variety, the Taynton Squaſh; but they have been fully ſufficient to convince me, that the diſeaſes of both chiefly ariſe from the debility of old age, and will be found equally incurable. Though the pear is more probably a naturalized than an indigenous fruit in this country, it is much more hardy than the apple, and may certainly be cultivated in almoſt every part of England with nearly as much ſucceſs as in Herefordſhire. Like the apple it grows with greateſt luxuriance in ſtrong deep ſoils, and in theſe the fineſt liquors are at preſent obtained from it; but it will flouriſh in every variety, where it is not incommoded with water. It's culture differs ſo little from that of the apple, that the ſame rules are in general equally applicable to both. It is moſt ſucceſsfully propagated on ſtocks of it's own ſpecies, but it will ſucceed in ſome degree on thoſe of the Quince, the Medlar, the Whitebeam, the common Service, and the Hawthorn; and probably on many others. When grafted on it's own ſeedling ſtocks, which alone I would recommend, the operation ſhould always be performed near the ground, on account of their reclining top-heavy growth. In raiſing ſtocks from the ſeeds of this fruit, much attention muſt be paid to them during the earlier part of the firſt ſummer, or great numbers will periſh. They muſt be kept clear from weeds, and regularly watered in dry weather; and if the mould be frequently ſtirred between the plants, it will be of great advantage to them: after the middle of Auguſt, little care or attention will be required from the planter.

A ſufficient number of varieties of this fruit, in a good ſtate of growth, are in cultivation; but few of them poſſeſs any high degree of merit. The greater part are extremely productive of juice, and require to be ground ſoon after they fall, or are blown from the trees. The produce of ſome of them, when it has been nicely manufactured from well ripened fruit, often poſſeſſes great excellence; but it is often at the ſame time ſweet, and acetous; and if, owing to an unfavourable ſeaſon, the fruit has not been properly ripened, and an exceſs of fermentation cannot be prevented,

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the liquor becomes ſour and unpalatable, and ſcarcely good enough to anſwer the meaneſt purpoſes of the farm-houſe. I am much diſpoſed to doubt whether a ſingle perry-pear, poſſeſſing nearly the greateſt degree of excellence of which this ſpecies of fruit is capable, has yet been in cultivation. It appears highly probable that firmer fruits, which might be kept ſome time, or left under the trees to attain a more perfect and regular maturity, are likely to afford a more permanent, and generous liquor. One pear, which in ſome degree anſwers this deſcription, has been much cultivated, the Longland; and though it's produce, being without the fine flavour which is found in ſome others, is little attended to by the merchant, it has qualities which render it extremely valuable to the farmer: the fruit may be kept ſome time without ſuſtaining any great degree of injury, when buſineſs of more importance occupies his attention: the liquor obtained from it is never very fine, but it is rarely below mediocrity: it poſſeſſes more body than is generally found in perry, and retains many of it's good qualities in every different ſoil and ſituation. It is a fruit I ſhould ſtrongly recommend for culture in cold and expoſed ſituations, for which the hardineſs of it's bloſſom renders it peculiarly well calculated; but I am afraid it is advancing nearly to that period when young trees can no longer be raiſed with advantage to the planter.

The pear is an extremely long-lived tree, and the ſame variety may in conſequence be very long kept in cultivation. At what period the Taynton Squaſh firſt ſprang from the ſeed, probably cannot now be at all aſcertained; but I ſuſpect from it's preſent diſeaſed and worn out ſtate, that it exiſted at leaſt as early as the beginning of the century before the laſt: for another kind, the Barland, which was much cultivated in the early part of the laſt century, ſtill retains a large ſhare of health and vigour, and the identical trees which ſupplied the inhabitants of Herefordſhire in the ſeventeenth century with liquor, are likely to do the ſame good office to thoſe of the nineteenth. I ſuſpect however that this variety naturally poſſeſſed a greater degree of durability, than is common to the ſpecies; and that it's lofty ſpiral growth, by rendering it difficult to get grafts from the extremities of the bearing branches, has in cultivation made it ſtill more durable. It is yet capable of being propagated; but trees nearly of the ſame ſtature with thoſe which now abound, muſt not again be expected. The tree, which is ſaid to have been the original, grew in a field called the Barelands in the pariſh of Boſbury, and was blown down a few years ago.

Though I do not think very highly of any of the perry-pears which are now cultivated, I do not know that I can point out the means of acquiring better. Thoſe which I have employed to obtain improved kinds of the apple, appear to me to be wholly improper. Every variety of that fruit, which poſſeſſes colour and richneſs, is capable of making fine cider, but a good perry-pear requires an aſſemblage of qualities, which will be rarely found in the ſame fruit. It muſt contain a large portion of ſugar, or it's juice can never poſſeſs ſufficient ſtrength, and unleſs it be at the ſame time extremely aſtringent, the liquor produced from it will be acetous whenever it ceaſes to be ſaccharine. In the latter ſtate it will agree with few conſtitutions, in the former with none. The juice of the beſt perry-pears is ſo harſh and rough, as to occaſion a long continued heat and irritation in the throat, when the fruit is attempted to be eaten; yet by being ſimply preſſed from the pulp it becomes rich and ſweet without more roughneſs than is agreeable to almoſt every palate. This circumſtance appears extraordinary, but it does not ſtand alone in the vegetable world. The root of the arum (wakerobin) is extremely acrid, and if chewed will produce very conſiderable pain in the mouth for many hours afterwards: but the expreſſed juice, with the ſpirituous or watery extracts, ſcarcely partakes at all of the acrimony of the root, tho' this, like the pulp of the pear, will be rendered mild and taſteleſs. The defects of the apple and pear, when raiſed from ſeed, are generally of oppoſite kinds: in the former the fruit is uſually harſh and ſour, in the latter it is apt to be, when thoroughly ripe, ſweet and inſipid. The mode of cultivation therefore which would improve the one by bringing it nearer to the highly cultivated ſtate and leſſening it's harſhneſs, would not improbably be injurious to the other by producing the ſame effects.

An eſtimate may be formed in the apple of the merit of the fruit by the leaf and growth of the ſeedling tree, but in the pear theſe ſcarcely afford the ſlighteſt indication of the future produce. The leaves of thoſe plants which will afterwards afford large rich fruits for the deſert are often ſmall and thin, and the ſtems will be covered with thorns; whilſt others, whoſe leaves and growth ſhew every mark of a high ſtate of cultivation, will ſometimes produce fruits which are ſmall and worthleſs.

I do not know that better means can be uſed in obtaining new varieties of this fruit, than ſowing a large quantity of ſeeds from healthy trees of an orchard in which the beſt kinds only have been planted, and afterwards ſelecting the plants of the moſt luxuriant and vigorous growth. But as no eſtimate can be formed of the value of their future produce, it will be prudent to retain a conſiderable number 'till their fruits be known: few of which I am afraid muſt be expected to anſwer the wiſhes of the planter.

I have during the laſt twelve years examined a very large number of ſeedling-pears, and have a conſiderable variety growing on a farm I occupy, but I have never diſcovered more than one kind, which I thought capable of making fine perry. The greater part of theſe however appeared to me to have ſprung from the ſeeds of rich eatable pears, and ſome of them bore a very cloſe reſemblance to the fruits of old grafted trees in the neighbouring orchards. There is little reaſon to believe that the reſemblance would have been leſs between the parent and the ſeedling fruit, had the former been eminent for the production of fine perry; and it therefore appears probable, that good new kinds may readily be obtained from the ſeeds of the beſt now cultivated. But even if few ſhould be found capable of affording fine perry, the produce of all will be valuable to the farmer to mix with crabs, or apples which have been blown prematurely from the tree. The vapid ſweetneſs of the juice of the pear is corrected by the acidity of theſe, and the liquor produced by the mixture often poſſeſſes much more merit, then could have been expected from the ingredients. It will perfectly ſupply the place of ſmall beer, and may be brought into the market at leſs than half the price, with ſufficient profit to the grower.

The time which ſeedling-trees will require to attain ſufficient maturity to produce fruit, appears to vary much in different varieties. I have one plant which produced fruit at ſixteen years old, and another which, from the concurrent teſtimony of many old people, who remember it's firſt bloſſoms, appears to have remained unproductive through the firſt ſeventy years of it's exiſtence. It has ſince born tolerably well; but it's fruit is always without ſeeds, or internal cavity; and it appears to ſet with difficulty, much the greater part of the bloſſoms being conſtantly unproductive. Poſſibly it's long continued barrenneſs, and the defects in it's fructification, may both have ariſen from ſome incidental imperfection in the organization of the plant. The fruit is in other reſpects perfect, and poſſeſſes great merit as an eatable pear.

The directions I have already given for planting the apple, are in every reſpect applicable to the pear; except that this tree, being of more luxuriant and lofty growth, will require wider intervals. In the moſt cloſely planted orchards the rows ſhould not be put at leſs than eighteen yards diſtance, nor the trees nearer than eight or nine to each other; and when the ground is to remain in tillage, intervals of twenty-five, or thirty yards, ſhould be allowed between the rows. Attention muſt alſo be paid to the forms and ſtature of the different varieties, and as the fruit of theſe is rarely mixed with a view to make fine perry, trees of one kind only ſhould occupy each row. In ſome kinds the fruit grows only on the outſide of thoſe branches which are expoſed to the ſun and air; in others it occupies every part of the tree. The former will of courſe require to be planted at greater diſtances than the latter.

The produce of the pear-tree, though of the ſame variety, and growing on the ſame ſtock, ripens extremely irregularly; and the planter muſt therefore have a conſiderable number of trees of each kind he plants, or he will rarely have a ſufficient quantity ready to be ground at the ſame time. Even when the fruit has fallen ſpontaneouſly from the trees, a fourth at leaſt of ſome kinds will be found immature, or decaying, and totally unfit to make fine perry; and ſhould be (though it rarely or never is) ſeparated from the reſt. The pear requires a certain ſtate of maturity to afford perry in the greateſt ſtate of perfection: it ſhould be ripe without being mellow, or decaying; when it has not obtained the proper ſtate of ripeneſs, an exceſs of fermentation cannot be prevented, and when it has exceeded it, the liquor rarely ferments kindly, and is extremely apt to become ſour; probably by having loſt too great a portion of it's aſtringency: hence few kinds are found to improve by being kept after they have fallen from the trees.

Pruning is not often wanted in the culture of the pear-tree, which is rarely much incumbered with ſuperfluous branches; but in ſome kinds, whoſe form of growth reſembles the apple-tree, it will ſometimes be found beneficial. The obſervations I have already made on the latter, are, under ſimilar circumſtances, equally applicable to this tree.

The blights of the pear, like thoſe of the apple, ariſe either from inſects, or unfavourable weather, or a combination of both. The bloſſoms are often rendered abortive, by a ſmall brown beetle, preciſely ſimilar to that found on the apple-tree, and probably of the ſame ſpecies; and a conſiderable quantity of it's fruit is frequently deſtroyed by the larvæ of a ſmall green four-winged fly. Each fruit which contains the latter inſects becomes in a few days rounder than thoſe in the natural ſtate, and grows with much greater rapidity; but it falls off early in the ſummer, and if it be examined whilſt growing, it will be found full of ſmall grubs. The pear-tree ſuffers more frequently from cold than from inſects, and therefore thoſe varieties whoſe bloſſoms are produced rather late in the ſpring, and are preceded by the leaves, are generally moſt productive of fruit; and ſome kinds of the pear, as of the apple, are much more ſubject to injury both from inſects and unfavourable weather, than others. I have one ſeedling tree whoſe bloſſoms appear capable of bearing the moſt unfavourable weather without injury, and which has not once failed to produce a good crop in the memory of the oldeſt inhabitant of the village in which it ſtands. The fruit is rather too ſweet to make good perry unleſs in mixture with other kinds, but it nevertheleſs forms a very valuable variety for cold and expoſed ſituations, as it ripens ſomewhat early in autumn.

In the manufacture of perry the pears are ground and preſſed precisely as apples are for cider; but it is not uſual to ſuffer the reduced pulp to remain any time unpreſſed. The management of the liquor during it's fermentation is alſo ſimilar to that of cider; but it does not afford the ſame criterions by which the proper moment to rack off may be known: the thick ſcum which collects on the ſurface of cider rarely appears on the juice of the pear, and during the ſuſpenſions of it's fermentation, the exceſſive brightneſs of the former liquor is ſeldom ſeen in this; but if the fruit has been regularly ripe, it's produce will generally become moderately clear and quiet in a few days after it is made, and it muſt then be drawn off from it's groſſer lees. An exceſs of fermentation is prevented by the means uſed in the manufacture of cider, and the liquor is rendered bright by iſinglaſs. The power this ſubſtance poſſeſſes of fining liquors appears to be purely mechanical: it is compoſed of innumerable fibres, which being diſperſed over the liquor, attach themſelves to, and carry down, it's impurities. For this purpoſe it ſhould be reduced to ſmall fragments by being pounded in a mortar, and afterwards ſteeped twelve or fourteen hours in a quantity of liquor ſufficient to produce it's greateſt degree of expanſion. In this ſtate it muſt be mixed with a few gallons of the liquor, and ſtirred 'till it is diffuſed and ſuſpended in it; and it is then to be poured into the caſk, and incorporated with the whole by continued agitation for the ſpace of two hours. This proceſs muſt be repeated 'till the required degree of brightneſs is obtained, the liquor being each time drawn off, on the ſecond or third day, from it's precipitated lees. Not more than an ounce and half, or two ounces of iſinglaſs are, I believe, generally put into a caſk of a hundred and ten gallons at once; but when it's mode of action is conſidered, I can ſee no objection to a larger quantity. This ſubſtance is moſt readily diffuſed in liquors by boiling; but by this it is diſſolved, and converted into glue; and it's organization, on which alone it's powers of fining depend, is totally deſtroyed. The application of it is ſometimes neceſſary in the manufacture of cider; but as it is rarely wanting in that liquor, I deferred inſerting the directions for uſing it, 'till I came to ſpeak of perry, which is ſeldom made thoroughly bright, or fit for the bottle, without it. The after-management of perry is the ſame as that of cider; but it does not bear ſituations where it is expoſed to much change of temperature, and it's future merit cannot ſo well be judged of by it's preſent ſtate. In the bottle it almoſt always retains it's good qualities, and in that ſituation I would always recommend it to be put, if it remains ſound and perfect at the concluſion of the firſt ſucceeding ſummer.

The pear though it furniſhes but an unpopular liquor, except in it's greateſt ſtate of perfection, poſſeſſes many advantages over the apple for general culture: it will flouriſh in a greater variety of ſoil, is much more productive, and being incapable, in thoſe varieties which are proper for perry, of being eaten or applied to any culinary purpoſe, it is little ſubject to be ſtolen in ſituations where fruits do not abound. As an ornamental tree, it poſſeſſes ſufficient merit to entitle it to a place, where ornament is the principal object: it's form is often pictureſque, and it's bloſſoms in the ſpring, and fruit in autumn, are always beautiful. Every tree, when nearly full-grown in moderately good ground, will afford an annual produce (taking many years together) of more than twenty gallons of liquor, on the loweſt computation, and an acre is capable of containing thirty at leaſt of ſuch trees; which, if of new varieties of fruit, will continue productive beyond the concluſion of a ſecond, and perhaps of a third, century. It muſt be admitted that the produce of different years is extremely unequal, and that a great year of fruit introduces much exceſs and irregularity in the cider-countries; on which account, I have met with a few individuals diſpoſed to deny that any advantage aroſe from the culture of the apple and pear: but their arguments were all founded on the abuſes of the liquors obtained from them, and therefore can have little weight when employed againſt the uſes, to which they might be applied. It cannot however be denied that the graſs in the orchard is injured in quality by the ſhade of the trees; but it always comes very early in the ſpring, when it is particularly valuable to the farmer, and the loſs in quantity will in few inſtances be found equal to one tenth of the value of the fruit. The propriety of tilling an orchard, when the trees are become large, may however be queſtioned; unleſs it be done with a view to render them more productive. Where a number of trees, ſufficient only to afford proper ſhade and ſhelter to the cattle, deſperſed over every county, great advantages would accrue to individuals at the ſame time that the face of the country would be greatly improved; the conſumption of enormous quantities of barley would be ſaved; and the farmer would be able to ſupply his family with a wholeſome and palatable beverage on much eaſier terms, than beer can ever be afforded; and in conſequence would cultivate his ground at leſs expence, and employ a larger portion of it in the production of wheat * and other articles more immediately neceſſary to ſociety.

* See a note at the concluſion

I cannot diſmiſs the ſubject without offering ſome apology for the imperfections of the foregoing treatiſe. The experiments, which have given exiſtence to it, have of neceſſity occupied much the greater part of twenty years, though they have required very little ſkill, or induſtry, at any one time. Ten years more muſt elapſe before the reſult of others I have made can be known, and I have in conſequence been often able to give an opinion only, where I wiſhed to have ſpoken from experience. But I have carefully ſeparated what I knew, from what I thought, and my facts, I am certain, are correct. Thoſe alone will, I believe, afford ſome information to the common planter, and will, I hope, ſerve to ſtimulate the inquiries of others: at a future time it may be in my power to offer a more perfect treatiſe. The ſubject is certainly intereſting to the gardener and farmer, and there are parts of it, which appear to me, not wholly undeſerving the attention of the philoſopher.

FINIS.

POSTSCRIPT.

AGRICULTURE is certainly much better underſtood at preſent, than it was fifty years ago; but it may reaſonably be queſtioned, whether in a national point of view, it is much better practiſed. In the former period, Great Britain raiſed as much corn as ſupplied it's own conſumption, and annually exported between ſix and ſeven million buſhels, taking the average of ſeven years: and from the year 1743 to 1748 the ſum of eight million ſeven thouſand nine hundred and forty-eight pounds was received by it for corn exported. The exportation in the two following years was ſtill greater; * but during the ſucceeding years this trade gradually declined, and in the eighteen years preceding 1788, the ſum of four million ſeven hundred and ſeventy-ſix thouſand pounds, or two hundred and

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* *Chalmer's Eſtimate.*

and ſixty-five thouſand three hundred and thirty-three per annum, had been paid for grain of different kinds to foreign nations. * I am not acquainted with the loſs this country has ſince ſuſtained; but it muſt have been enormouſly great, and rapidly increaſing: yet the farmer of the preſent day poſſeſſes the advantages of a larger capital, and of ſuperior ſkill and machinery; but theſe are more than counter-balanced by the extended influence of the Tithe-Laws, or more properly the modern deciſion of the Court of Exchequer.

The county of Hereford contains at leaſt two hundred thouſand acres of arable land, ſubject to Tithes: to put this in an improved and proper ſtate of cultivation would require an annual expence in labour and manure, in addition to the preſent, of more than ten ſhillings an acre; and this ſum might eaſily be employed to pay the farmers ten per cent for

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* *Repreſentation of the Lords of the Committee of Council &c. on the Importation and Exportation of Corn.*

for their money, and conſequently to bring into the market the value of one hundred and ten thouſand pounds of increaſed produce, and to find conſtant employment to five thouſand labourers. But out of this ſum the Tithe-man would take the tenth, or eleven thouſand pounds, and the farmers would in conſequence loſe the whole intereſt of their money, with one per cent of their capitals. The improvement of ſtock, and of ground not in a ſtate of tillage, would require at leaſt as large a ſum, which cannot be employed by the farmers, as long as the Tithe-Laws remain in their preſent moſt oppreſſive form.

The profits of tillage, when the land is not rich, are extremely ſmall to the farmer: more than half the arable land of Herefordſhire is tilled for a leſs produce than twelve buſhels per acre; even when the ground has lain fallow during the preceding ſummer. This, with the ſtraw, may be reckoned worth about five guineas, out of which ten ſhillings and ſix-pence belong to the Tithe-man, and the remaining ſum is ſcarcely ſufficient to repay the farmer his expences: by a late deciſion of the Court of Exchequer, or rather by a new law made by it, the ſtubble is alſo become titheable.

The wages of the day-labourer taking the average of the kingdom are not leſs than fifteen pence a day: the farmer muſt be repaid this expence by an increaſe in the produce of his ground, equal to the quantity of labour he purchaſes; and if he forfeits the tenth of that produce, he pays three-halfpence a day to the Tithe-man for every labourer he employs; and he muſt either deduct that ſum out of the wages of the abourer, or ſet a higher price on the produce of his labour. In either caſe the loſs falls on the unhappy cottager, and ultimately on the pariſh. But the evil does not end here; high, or indeed proper cultivation, will rarely pay more than ten per cent, and therefore a deduction of a tenth, or of eleven per cent, acts as an abſolute prohibition. The employment of the labourer is conſequently cut off, the ground becomes leſs productive, and the wages of the labourer are depreſſed, whilſt the price of proviſions is raiſed in the market.

Some pains have been taken to confound * the Tithes with the rent paid to the landlord; and to prove that the one is not more injurious to agriculture, than the other; but the latter is a tax on the land, the former on the labour and capital employed on it. The farmer pays the ſame ſum to the landlord, whether his field be covered with corn, or with brambles; and he is therefore ſtrongly ſtimulated, and indeed compelled, to employ it in the moſt advantageous manner to himſelf, and to the public; but to the Tithe-man he pays the tenth of the produce of his labour and expences, and this in an highly manured field of wheat will very

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* *In a pamphlet by "a Maſter of Arts of the Univerſity of Cambridge."*

very frequently amount to more than two hundred per cent on the annual value of the ground, and will take away the whole profits of the farmer. He muſt therefore contract his expences, and adopt the ruinous and prevailing ſyſtem of raiſing little at proportionably ſmaller expence. The ſame acre which under his former ſyſtem produced eighteen buſhels of wheat, at the expence of ſix pounds, will now produce ten, at the expence of three pounds: the public here ſuſtains a loſs of eight buſhels of wheat, but the farmer will often be a gainer, and will always have the ſatisfaction of having injured his enemy, the Titheman.

The farmer pays the tenth of the groſs produce of his farm, which includes the rent of his land, barns and houſe, the coſt of his implements of huſbandry, and of his labouring cattle; the intereſt of his remaining ſtock and crop, and the whole of the labour and manure he purchaſes. Let ſuch a tax be laid on any branch of manufacture, in which this country poſſeſſes the greateſt excluſive advantages, and it would be immediately ruined. If the clothier were to forfeit the tenth piece of cloth, when manufactured, without having any allowance made for the rent of his buildings, his machinery, the labour he employed, or the raw material he purchaſed; he would inſtantly be underſold in every market in Europe; and a great advance in the price of the produce of his manufactory muſt be paid by the Inhabitants of this country, which would be ſupplied with cloth, as it is now with corn, on lower terms by foreign nations: many thouſands of induſtrious poor, who receive their maintenance from the woollen trade, muſt then ſeek ſubſiſtence in other countries, or be ſupported, as a great part of thoſe which agriculture might employ, now are, by the pariſh.

As a tax the Tithes fall with accumulated weight on thoſe animals, which in the poſſeſſion of the farmer are moſt extenſively uſeful to ſociety. The tenth only of the produce of animals, as of the earth, belongs to the church; but by the deciſions of our moſt equitable Court of Exchequer, the tenth fleece of the ſheep, the tenth lamb, the tenth of the wool of the remaining nine, and the tenth of the herbage they afterwards conſume, if ſold before they are ſhorn again, are annually forfeited. This I ſuppoſe, forms a fair *eccleſiaſtical* tenth, but it appears to me rather to exceed an arithmetical one. The tenth calf of the cow, and the tenth meal of milk, are paid when the animal is fed on hay, which has already paid Tithe; and the tenth increaſe of the hog, which is maintained by the milk, which has virtually been twice tithed already, belongs alſo to the Tithe-man.

Though the farmers feel more immedaitely the oppreſſion of the Tithe-Laws than any other members of ſociety, they are leaſt intereſted in obtaining a Commutation of Tithes: it is true they forfeit the tenth of their corn, and the tenth of the ſtraw, which ought to afford manure for the ſucceeding ſeaſon; and though they are compelled to cultivate their ground improperly, and at two ſmall an expence, and conſequently to bring little into the market, they are ſure to ſell that little at an exorbitant price. The Tithe is therefore levied on the conſumer, and hence have ariſen the diſtreſſes of the lower order of tradeſmen, and of the peaſantry, whilſt the farmers have grown rich. The exceſſively high price of every article of proviſion has given a ſtimulus to agriculture, which has rendered corn at preſent, in ſome degree, abundant; but the ſame cauſes, which have produced one ſcarcity, will produce another; and if the Tithe-Laws remain in their preſent form, wheat will ſoon be ſold again at double it's preſent price. I believe it is in my power to bring evidence, that more than a thouſand buſhels of corn have at once ceaſed to be produced in a ſingle pariſh, in more than one inſtance, in this county, and great loſſes in others have come under my own

obſervation,

obſervation, during the laſt ſix years, owing to quarrels between the clergy and their pariſhioners on the ſubject of Tithes: theſe loſſes have been fully ſufficient to produce a local ſcarcity, and I believe as great, and in many inſtances greater loſſes, have been ſuſtained in other parts of the kingdom; for this has much leſs reaſon to complain of the clerical, and even of the lay impropriators, than many others. In ſome counties the crops of corn are annually valued whilſt in bloſſom, and each farmer is fined according to his ſkill and induſtry, and the number of labourers, or poor, he has employed; and the clergyman will not always condeſcend to treat with his pariſhioners individually, but lets the Tithes in the maſs to the beſt bidder.

It may be ſuppoſed that the Tithes by acting as a heavy, and oppreſſive, tax on tillage, and conſequently as a bounty on paſturage, would tend to leſſen the price of animal, as well as to raiſe that of vegetable, food; but I can ſpeak from experience that a highly cultivated acre of tillage, with proper change of crops, will always bring into the market more animal food, independant of the wheat it produces, than the ſame acre in paſture can be made to do: it is nevertheleſs almoſt always the intereſt of the farmer to diſcharge his labourers, and to contract his expences by converting his ground to paſture, whenever he cannot enter into a fair compoſition with the poſſeſſor of Tithes.

However oppreſſive, and injurious, the Tithe-Laws are found in this country, in Ireland they are infinitely more ſo. Almoſt the whole of the farmers and peaſantry there are either Roman Catholics, or Diſſenters; yet all are compelled to pay Tithes to the eſtabliſhed clergy, though they ſupport their own by voluntary contributions. Such a tax alone, did they receive no other unneceſſary provocations from the blind and bigoted obſtinacy of the preſent adminiſtration, is fully ſufficient to account for the aſſociations of the united Iriſhmen, and defenders, and for their wiſh to put themſelves under the protection of France.

The natural value of corn, as of every other article, is the price at which it can be brought into the market, paying the expences of rent and labour, and the intereſt of ſtock: a tax, amounting to a tenth on each of theſe, neceſſarily raiſes it's value ten per cent: but by rendering a proper ſtate of cultivation impracticable, the Tithes have had the aditional effect of producing a ſcarcity; and I am thoroughly confident that every claſs of ſociety has payed during the laſt ſeven years nearly two ſhillings a buſhel in the price of corn, and twenty per cent on every other article of proviſion, owing to the Tithe-Laws; and that theſe now occaſion a heavier burthen on the lower claſſes of ſociety than all the accumulated weight of taxes in the aggregate.

It muſt however be admitted that other cauſes have operated, though in a very inferior degree, to produce the preſent ſcarcity, and conſequent high price of proviſions. An increaſe of population, and of deſtructive luxury, has no doubt taken place; but I cannot admit that theſe cauſes would have been adequate to counter-balance the advantages which this country receives from the extended culture of potatoes, and which the farmers would have received from the uſe of their ſuperior ſkill, capital, and machinery, had they not been prohibited uſing them.

The ſcarcity and high price of proviſions, have been attributed, but I think very erroneouſly, to other cauſes; to the extenſion of paper-credit, to an increaſe in the ſize of farms, and to the advance in the rent to the landlord. The enormous quantity of paper in circulation may poſſibly tend to increaſe the price, but by no means to produce a ſcarcity of proviſions; for it enables the farmer to employ a larger capital, and conſequently to render his ground more productive. The circulating capital, which the agriculture of England might, and ought to employ, either in ſpecie, or paper, probably exceeds that now in uſe at leaſt ſix millions ſterling: and I am thoroughly confident that this ſum might eaſily be employed, and that corn to the value of three, or four millions ſterling, might be annually ready for exportation, after the wants of the preſent number of inhabitants, Great Britain contains, had been abundantly ſatisfied.

Farms are no doubt in ſome inſtances much too large; but ſmall ones, I am afraid, can never be made productive to the community. The farmer who rents but fifty pounds a year in a ſtrong-ſoiled diſtrict, muſt keep, though he cannot properly employ, four horſes, and theſe will nearly conſume the whole produce of his farm. Six horſes, with the aſſiſtance of oxen, are fully ſufficient to cultivate a farm of two, or three, or even of four, hundreds a year, and the ground, I fear, (for I wiſh much to think otherwiſe) will always be tilled to the greateſt national advantage under the latter diviſions. Many people are inimical to large farms becauſe they remember that proviſions were more cheap, when ſmall ones abounded; but the great manufacturing towns, which now drain the ſurrounding counties, did not then exiſt. Small farms would no doubt add to the comforts of the inhabitants of the neighbouring ſmall towns, but thoſe muſt give way to conſiderations of greater national importance: very large farms however are every way injurious.

The increaſe in the rents of the landlords is the effect, but never can be the cauſe of the high price of proviſions. If the farmers had little, or no rents to pay, their corn would produce as high, and probably a higher price than it does at preſent; for much more would be conſumed in what is now the farm houſe, and the farmer being able to live in eaſe and affluence, would too often indulge himſelf in indolence, and exceſs, and little of courſe would be brought to market; that little would certainly be ſold at an exorbitant price, and a famine would be the inevitable conſequence. Whoever will examine the ſtate of ground which is let much below it's natural value, will generally find it ill cultivated, and unproductive, affording little employment for the labourer, or proviſion for the market.

The operation of a Corn-Rent would be diametrically oppoſite to that of the Tithes, and by it, the revenues of the clergy would be made as beneficial to agriculture, as they are now ruinous, and deſtructive: it would alſo tend much to reconcile (and that ſhould be amongſt the firſt objects of every government) the diſcordant intereſts of the grower, and of the conſumer of corn, which unfortunately are for ever at variance. If every farmer, whoſe eſtate ought to produce any given number of buſhels of corn, or the value of ſuch quantity, under a fair ſtate of cultivation, were to pay the clergyman the price of a tenth of that quantity in the market-places of the neighbouring towns, taking the average of the prices of the year, they would take care that thoſe markets ſhould be properly ſupplied, and the grower and conſumer would meet without the intervention of a third perſon. If the farmers witheld their corn from the market to increaſe it's price, a Corn-Rent would increaſe in the ſame proportion, and would act as a powerful check on every ſpecies of monopoly: if they did not properly cultivate their ground, and the markets were in conſequence ill ſupplied, it would be a tax on their indolence; and if on the contrary great exertions were made by them, and corn became in conſequence cheap, and abundant, it would act as a bounty on their induſtry.

I have ſeen only one publication in the defence of the Tithe-Laws, written by a gentleman who ſigns himſelf "a Maſter of Arts of the Univerſity of Cambridge:" he has witheld his name, and has acted prudently in doing ſo, for his pamphlet contains little but declamatory miſrepreſentation and falſe ſtatement, apparently intentional.

Some of his objections to a Commutation of Tithes are ſo curious as to deſerve attention. He objects to a Corn-Rent on the ground that, if wheat were made the ſtandard, (as it uſually is) the inhabitants of England might ceaſe to uſe it, and might live on ſiberian barley and potatoes, by which the clergy would ſuſtain "eſſential, and irreparable injury." He dwells much on the great advantages the farmers at preſent poſſeſs by having ſo many opportunities of receiving "friendly advice, and perſuaſion" from the clergyman, when he comes to look after his Tithes; and objects to every ſpecies of Commutation, becauſe it would tend to leſſen the frequency of this bleſſed intercourſe. He alſo thinks that nothing would ſo much reſtore harmony between the paſtor and his flock, and ſilence the murmurs and diſcontents of the farmers and peaſantry, as an act to compel the clergy to collect all their Tithes in kind, and conſequently to render themſelves as injurious, and oppreſſive, as poſſible: and he aſſerts that wherever this plan has been put in execution for any length of time, the "greateſt harmony" has ſubſiſted between the incumbent and his pariſhioners. He has not however condeſcended to mention an inſtance in which this "greateſt harmony" ever ſubſiſted; and I will venture to aſſert that he could not point out one where a clergyman had long collected the whole of his Tithes, in which the moſt rancorous, and inveterate degree of hatred did not exiſt between him, and the occupiers of land in his pariſh. This pamphlet is, I believe, generally attributed to the Lord Biſhop of R-------; but I cannot conceive it poſſible, that the author of ſo weak, and ſo extremely diſingenuous, a production, at preſent occupies ſo high and honourable an office in the church.

It is certainly the intereſt of every claſs of ſociety to obtain ſome kind of Commutation of Tithes; but the clergy are particularly intereſted: land, I am confident, can not be given without great injury to the church, and to the community, though it might with great propriety be given, or at leaſt offered, to the lay impropriators, and would, I believe, be very generally accepted by them. A Corn-Rent, or ſomething ſimilar to one, would afford a much better maintenance for the clergy, than they now poſſeſs, and would be preferred by a large majority of them. If wheat alone will not afford a proper ſtandard, by which the permanent value of Tithes may be eſtimated, I cannot ſee the leaſt difficulty in having a clerk appointed in every market-town to regiſter the weekly price of the other neceſſaries of life, which are furniſhed by the farmer. A tax of half a farthing a year, on every acre of ground ſubject to Tithes, would more than pay the ſalaries of ſuch officers, and to ſuch a tax the landed intereſt would readily ſubmit. If any difficulties occur to the reader in the execution of this plan, I would wiſh him to turn his attention for a moment to the nature of agiſtment Tithes. The poſſeſſor of theſe is entitled to a tenth of the produce of all ground depaſtured with unprofitable cattle; but the produce of every acre varies in almoſt every month in the year; and is greater, or leſs, as the ſeaſon is more, or leſs, favourable: every field is alſo depaſtured partly with unprofitable ſtock, which pays Tithes, and with profitable ſtock, which is exempted; and it is impoſſible to aſcertain with any degree of accuracy what portion is conſumed by either of theſe. The tenth of the improved value of the unprofitable cattle cannot be taken without the greateſt injuſtice to the farmer; for this, in ſome of the moſt improved breeds, would not unfrequently be more than equal to the value of the whole produce of the field.

The clergy are in general very moderate in their demands, and to their moderation the poor are indebted for the ſcanty ſubſiſtence they poſſeſs; yet the whole odium of the Tithes lies on them. The income they receive almoſt always bears an inverſe proportion to their merits; the few who are rapacious and oppreſſive, and who are regardleſs of every thing, but their own intereſt, being alone well paid. The farmers, and peaſantry will always conſider the clergyman, who demands nearly the value of his Tithes as their perſonal enemy:

they cannot ſee, and it would be moſt wonderful if they could, the equity of many of the late deciſions of the Court of Exchequer: and they look on the clergyman as the cauſe of the injuſtice, and oppreſſion, they ſuffer: under ſuch circumſtances he can be little inſtrumental in promoting the cauſe of religion. Let his morality, and precepts, be ever ſo perfect, his ſincerity is ſuſpected, his honeſty is called in queſtion, and his every action is ſeen through a falſe medium: that reſpect, and eſteem, which alone can render the clergy in the preſent times of ſervice to ſociety, are totally annihilated, and the paſtor is loſt in the collector of Tithes.

Neceſſary as a Commutation of Tithes is to the exiſtence of this country, I am confident that it will meet with the moſt ſtrenuous oppoſition from the preſent miniſter, and I am afraid he will be warmly ſupported by the narrow ſhort-ſighted policy of a part of the Biſhops. Should their oppoſition be ſucceſsful, agriculture cannot poſſibly keep pace with the increaſing conſumption and demand of proviſions:

their price will in conſequence become annually more diſproportionate to that of labour, the clergy will become annually more hated, the diſtreſſes and diſcontents of the lower claſſes of ſociety will rapidly increaſe, and the Tithes, with the poſſeſſors, will ſoon diſappear together, without an act of the legiſlature. Theſe evils can only be averted by a general petition of the people of England for an immediate Commutation. When one county petitions, others will immediately follow it's example, for all are equally intereſted. I hope the county I live in, and to which I wiſh moſt particularly to addreſs this note, as well as the foregoing treatiſe, will have the honour to preſent the firſt petition. In taking an active part to promote it, I cannot juſtly be accuſed of acting from any motive of private intereſt: the property I poſſeſs is tithe-free; and I muſt of courſe be a loſer, when I no longer poſſeſs any excluſive advantages.

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ERRATA.

PAGE 25 *line* 5 for calcarious *read* calcareous.
81 *line* 13 for opperation *read* operation.
159 *line* 18 for where *read* were.
160 *line* 3 for deſperſed *read* diſperſed.